Computer Engineering Department
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LAB04: Geometric Transformation (Part1)

Objectives

Upon completion of this lab, you will be able to:

1. Write a program in MATLAB to decrease the size of an original image using point sampling and local averaging.
2. Write a program in MATLAB to increase the size of the original image using pixel replication and midpoint interpolation.
3. Write a program in MATLAB for increasing and decreasing the size of the original image using nearest neighbor interpolation and bilinear interpolation.

Exercises

Note that you should create your own program in MATLAB. It means that you cannot call MATLAB built-in function, which generates output in the same manner as your own program. You can use the images provided in the folder **\Google Drive\EGCI486-Image Processing\Second(2015-2016)\LABs\LAB04_Part1** for your exercises.

1) Decreasing the original image size

1.1 Write a program in MATLAB to decrease the size of an original image using point sampling, with the following program name: Propointsam.m. Using this program on the image "woman_blonde.tif" should give you result as shown in Figure 1.

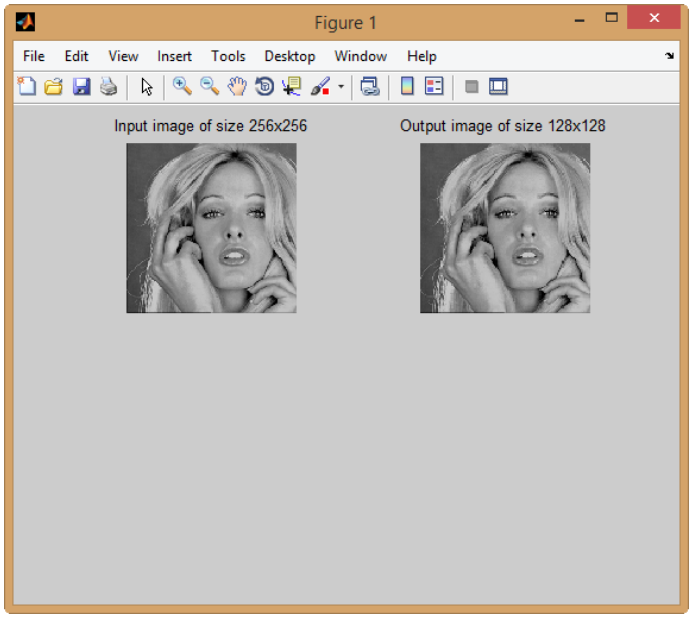

Figure 1: The decrease image resulted from resizing the original image size from 256×256 to 128×128, using point sampling.

1.2 Write a program in MATLAB to decrease the size of an original image using local averaging, with the following program name: Prolocalaver.m. When this program is used with the image "woman_blonde.tif" result as shown in Figure 2.

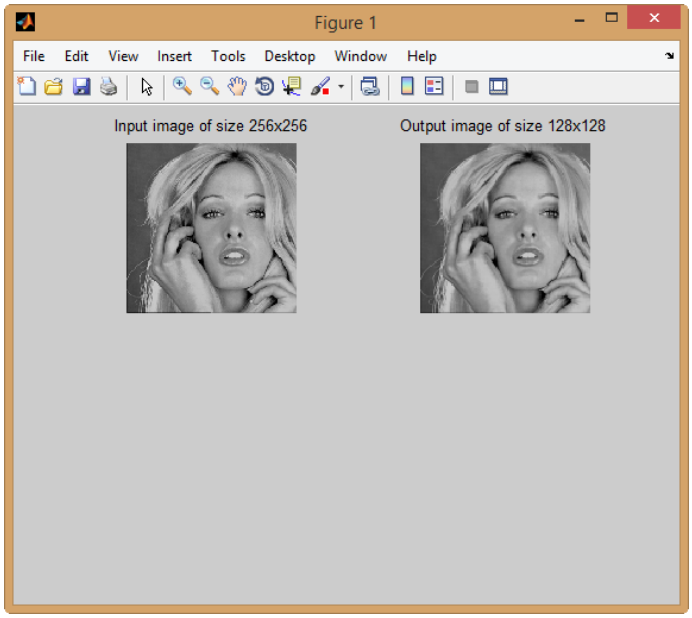

Figure 2: The decrease image resulted from resizing the original image size from 256×256 to 128×128, using local averaging.

2) Increasing the original image size

2.1 Write a program in MATLAB to increase the size of the original image using pixel replication, with the following program name: Propixelrep.m. Using this program on the image "woman_blonde.tif" should give you result as shown in Figure 3.

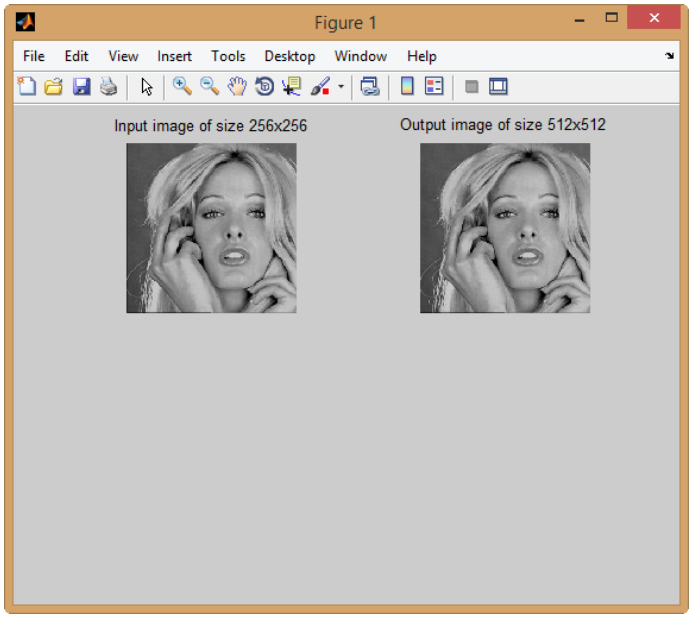

Figure 3: The increase image resulted from resizing the original image size from 256×256 to 512×512, using pixel replication.

2.2 Write a program in MATLAB to increase the size of the original image using midpoint interpolation, with the following program name: Promidpoint.m. When this program is used with the image "woman_blonde.tif" result as shown in Figure 4.

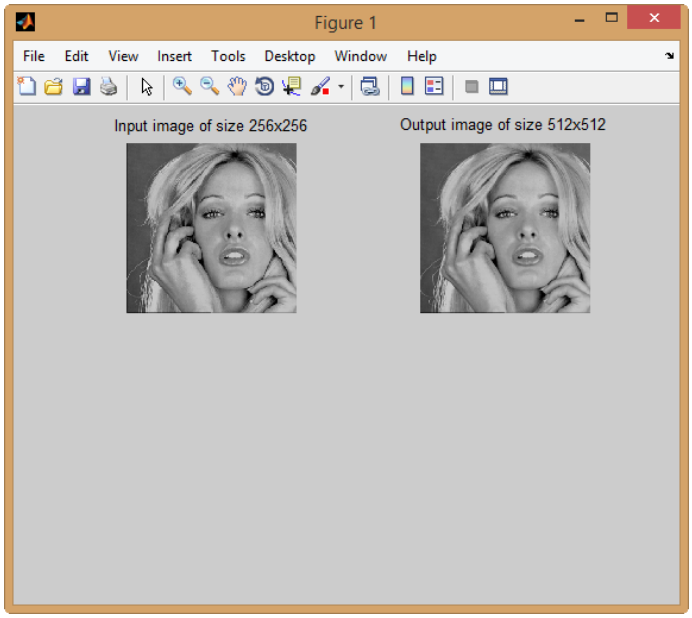

Figure 4: The increase image resulted from resizing the original image size from 256×256 to 512×512, using midpoint interpolation.

3) Adjusting the original image size

3.1 Write a program in MATLAB for increasing and decreasing the size of the original image using nearest neighbor interpolation, with the following program name: Pronearest.m. Using this program on the image "woman_blonde.tif" should give you result as shown in Figure 5.

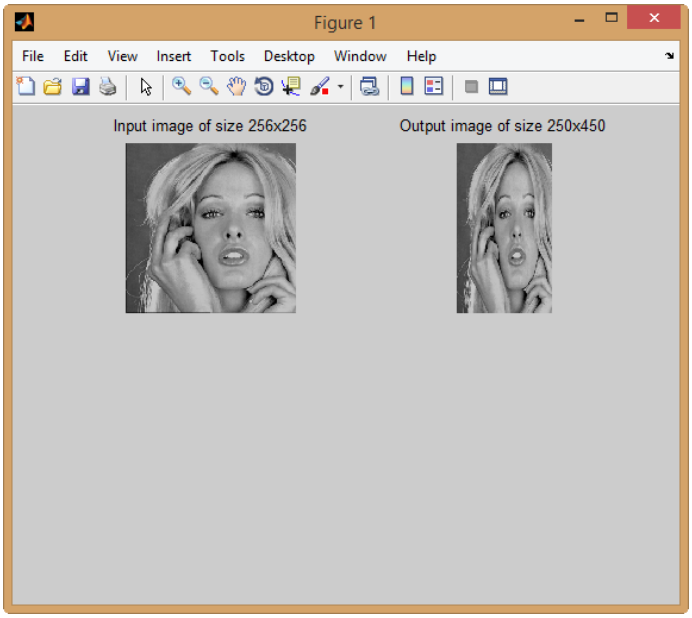

Figure 5: The adjust image resulted from resizing the original image size from 256×256 to 250×450, using nearest neighbor interpolation.

3.2 Write a program in MATLAB for increasing and decreasing the size of the original image using bilinear interpolation, with the following program name: Probilinear.m. When this program is used with the image "woman_blonde.tif" result as shown in Figure 6.

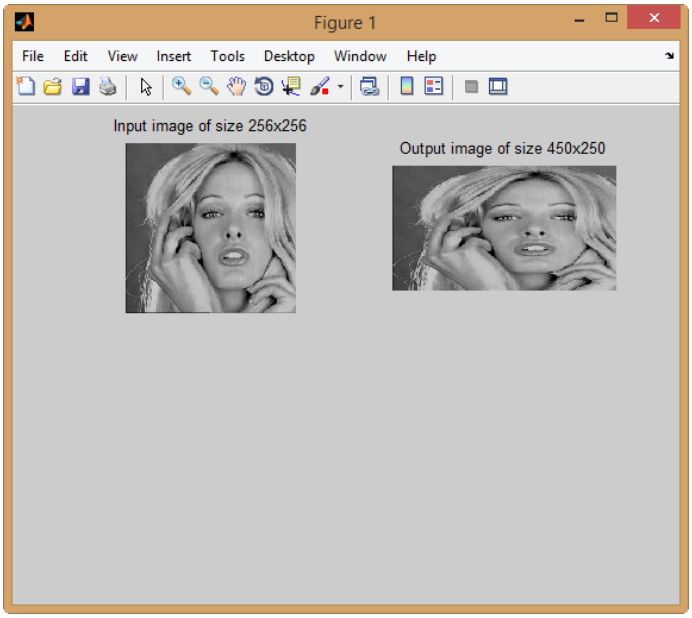

Figure 6: The adjust image resulted from resizing the original image size from 256×256 to 450×250, using bilinear interpolation.